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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/696,106	10/24/2000	Danielle Kathyrn Dittrich	BLD920000105US1	4145

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EXAMINER
VIDA, MELANIE M

ART UNIT	PAPER NUMBER
2626	6

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/696,106	DITTRICH ET AL.	
	Examiner	Art Unit	
	Melanie M Vida	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 October 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-10,12-18,20-26,28-34,36-42 and 44-50* is/are rejected.

7)☒ Claim(s) *3,11,19,27,35 and 43* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 October 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement(s) (IDS) submitted on 9/21/01 has been considered by the examiner and is attached to this office action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 6-8** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "the greater LPI" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claims 7-8 are rejected under 35 USC 112, second paragraph, for depending on claim 6.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1, 2, 4, 5, 9, 12, 13, 14, 15, 16, 17, 18, 21, 25, 28, 29, 30, 31, 32, 33, 34, 37, 41, 44, 45, 46, 47, 48, 49, 50** are rejected under 35 U.S.C. 102(b) as being anticipated by Kitagawa et al. US-PAT-NO: 5,055,923 (hereinafter, Kitagawa).

Regarding, **claim 1,** the Applicants define the number of parallel lines through the dots per inch is the halftone screen frequency defined as lines per inch (LPI) in the specification on page 2, lines 10-11. Kitagawa specifically defines the substantial screen ruling (i.e. LPI) using the equations shown in column 16, lines 1-7 and 25-30, wherein the substantial screen ruling is equal to the number of parallel lines per inch. Therefore, in **claim 1,** Kitagawa presents a method and an apparatus for reproducing a color image by recording color halftone images, $\mathbf{I_{Y1}}$, $\mathbf{I_{M1}}$, $\mathbf{I_{C1}}$, and $\mathbf{I_{K1}}$, for the color components cyan (C), black (K), magenta (M), and yellow (Y) consisting of halftone dots $\mathbf{H_{Y1}}$, $\mathbf{H_{M1}}$, $\mathbf{H_{C1}}$, and $\mathbf{H_{K1}}$, which reads on "a method for halftoning an input image comprised of at least two input color components", (col. 1, lines 8-12; col. 4, lines 30-40). Further, the density signals S_p (i.e. density is inversely related to intensity) that correspond to each color component, in accordance with their coordinate of the recording position, which reads on "wherein each input color component provides input intensity values for the color component at pixel locations in the image, comprising:", (col. 10, lines 22-29). Kitagawa states that the first and second halftone images I_{M4} and I_{C4} have a common screen angle and a common screen pitch, the differences of the substantial screen ruling can be made less than about **20%** satisfying equation 7:

$$\mathbf{P_a \geq P_b \geq 0.75 \times P_a,}$$

wherein, $\mathbf{P_a}$ is a first screen pitch or a second screen pitch of the first and second halftone image and $\mathbf{P_b}$ is a pitch of halftone dot centers measured perpendicular to the screen pitch $\mathbf{P_a}$, which reads on "accessing at least two halftoning screens, wherein there is one screen for each color component, and wherein at least one of the screens generates halftone output having a lines per inch (LPI) that is at least approximately twenty percent different than the LPI of the halftone

output generated by one other screen;", (col. 19, lines 27-43). As shown in figure 4a, a color scanner (1) reads an original (OF) via a pick-up head (7) that performs color separation, which reads on "separating the input image into the separate color components; and", (col. 8, lines 36-40; and col. 8, lines 49-57). The individual density signals S_P are applied to the halftone signal conversion circuit (9) that further comprises a screen pattern data memory (SPM) (93) that functions to generate a halftone dot pattern for every pixel to convert S_P to a dot signal S_d, representing halftone dots to be recorded, which reads on "applying the accessed screen for each color component to the input intensity values for the color component to produce the halftone output for the color component, wherein the combined halftone output for all the color components from the output pixels", (col. 8, lines 57-61; col. 9, lines 6-15).

Regarding, **claim 2,** Kitagawa states that the image data processing circuit (8) performs color correction and converts the color separation signals into density signals for yellow (Y), magenta (M), cyan (C), and black (B) printers, respectively, which reads on "a method wherein the input image includes four color components", (col. 8, lines 52-57).

Regarding, **claim 4,** Kitagawa states that the image data processing circuit (8) performs color correction and converts the color separation signals into density signals for yellow (Y), magenta (M), cyan (C), and black (B) printers, respectively, which reads on "wherein the four color components comprise cyan (C), magenta (M), yellow (Y), and black (K)", (col. 8, lines 52-57).

Regarding, **claim 5,** Kitagawa inherently teaches, "wherein the halftone output generated by the screen for the black (K) color component has an LPI that is at least approximately 20%

greater than the LPI of the halftone output generated by at least one of the other cyan (C), magenta (M), and yellow (Y) screens" as evidenced in that that the differences of the screen rulings among the three colored halftone images, such as magenta, cyan, and black, (Im4, Ic4, Ik4), are desirably less than 20 percent in view of the stability of the color tone of the reproduced image, (col. 19, lines 25-29).

Regarding, **claim 9,** Kitagawa states that the ratio of the first screen pitches P1m6 and P1c6 are not limited to 3:2 as described in equation 7, but it can be any ratio expressed with integers, which reads on "wherein the LPI's of the halftone outputs generated by at least two of the screens have a ratio of approximately 3:2 or 4:2 of the LPI of the halftone output generated by at least one screen is approximately an integer multiple of the LPI of the halftone output generated by at least one other screen", (col. 19, lines 25-42; col. 20, lines 17-59).

Regarding, **claim 12,** Kitagawa, as shown in figure 8a, depicts that a screen pattern consisting of digital threshold values allocated to each pixel PX, which reads on "the screens comprise threshold matrices including threshold intensity values", (col. 11, lines 40-45).

Regarding, **claim 13,** Kitagawa teaches that the digital threshold values from the screen pattern are supplied to a comparator (94) with respect to each pixel to be compared with the value of the density signal S_p and when this value is greater the screen pattern data, the comparator (94) generates a dot signal S_d representing the corresponding pixel to be exposed, which reads on "applying the screen to the input intensity values for each color component comprises: comparing the input intensity value to a corresponding threshold intensity value in

the threshold matrix for the color component; outputting a first output intensity value if the input intensity value is less than the corresponding threshold intensity value; and outputting a second output intensity value if the input intensity value is greater than or equal to the corresponding threshold intensity value", (col. 11, lines 40-54).

Regarding, **claim 14,** Kitagawa teaches that the comparator (94) as shown in figure 4b, receives the density signals S_p for each color component and generates a dot signal S_d representing whether the recording pixel at the recording position is to be exposed (i.e. full intensity) or not (i.e. zero intensity), which reads on "wherein the first and second output intensity values are capable of indicating zero intensity or full intensity for the color component" (col. 10, lines 21-28; col. 11, lines 45-52).

Regarding, **claim 15,** please refer to the corresponding rejection in claims 13-14.

Regarding, **claim 16,** please refer to the corresponding rejection in claim 2.

Regarding, **claim 17**, Kitagawa teaches a block diagram showing the structure of a color scanner according to the preferred embodiment of the present invention, which reads on "a system", (col. 8, lines 27-29). Kitagawa teaches that the block diagram comprises a halftone signal conversion circuit (9), which reads on "for halftoning" an original (OF), which reads on "an input image" comprising red (R), green (G), and blue (B), which reads on "comprised of at least two color components" wherein the density signals S_p, (i.e. density is inversely related to intensity) respective to each color component, in accordance with their coordinates of the recording position, which reads on "wherein each input color component provides an input intensity values for the color component at pixel locations in the image", (col. 8, lines 36-64; col. 10, lines 22-29). Kitagawa further recites that the halftone signal conversion circuit (9) further

comprises a screen pattern data memory unit (or SPM unit, 93), which reads on "a memory" for storing respective screen pattern data D_y, D_m, D_C, and D_k, which reads on "for storing at least two halftoning screens", (col. 9, lines 5-9; and col. 9, lines 54-60). The respective screen pattern data D_y, D_m, D_C, and D_k are stored individually one for each color, such as yellow (Y), magenta (M), cyan (C), and black (K), which reads on "wherein there is one screen for each color component", (col. 6, lines 56-57; col. 7, lines 54-60).

Further, Kitagawa teaches that the block diagram comprises a pick-up head (7) that performs color separation operation to generate color separation signal S_I having red (R), green (G), and blue (B) components, which reads on "means for separating the input image into the separate color components;", (col. 8, lines 49-52).

The halftone signal conversion circuit (9) applies the screens stored in the SPM to produce the respective dot signals (S_d) representing halftone dots to be recorded, which reads on "means for applying the screen for each color component to the input intensity values for the color component to produce the halftone output for the color component, wherein the combined halftone output for all the color components form the output pixels", (col. 9, lines 6-15; col. 10, lines 18-30).

Regarding, **claim 18,** please refer to the corresponding rejection in claim 2.

Regarding, **claim 20,** please refer to the corresponding rejection in claim 4.

Regarding, **claim 21,** please refer to the corresponding rejection in claim 5.

Regarding, **claim 25,** please refer to the corresponding rejection in claim 9.

Regarding, **claim 28,** please refer to the corresponding rejection in claim 12.

Regarding, **claim 29,** please refer to the corresponding rejection in claim 13.

Regarding, **claim 30,** please refer to the corresponding rejection in claim 14.

Regarding, **claim 31,** please refer to the corresponding rejection in claim 15.

Regarding, **claim 32,** please refer to the corresponding rejection in claim 16.

Regarding, **claim 33,** Smilansky inherently teaches, "an article of manufacture including logic" as evidenced by the rejection in claim 1, and the corresponding rejection in claim 17.

Regarding, **claim 34,** please refer to the corresponding rejection in claim 2.

Regarding, **claim 37,** please refer to the corresponding rejection in claim 5.

Regarding, **claim 41,** please refer to the corresponding rejection in claim 9.

Regarding, **claim 44,** please refer to the corresponding rejection in claim 12.

Regarding, **claim 44,** please refer to the corresponding rejection in claim 13.

Regarding, **claim 46,** please refer to the corresponding rejection in claim 14.

Regarding, **claim 47,** please refer to the corresponding rejection in claim 15.

Regarding, **claim 48,** please refer to the corresponding rejection in claim 16.

Regarding, **claims 49-50,** Smilansky inherently teaches, "the logic is implemented as code in a computer readable medium accessible to a processor that executes code", and "the logic is implemented in circuitry within an integrated chip" as evidenced by the block diagrams of figure 4a-4b, and further evidenced in that it is obvious that a processor that executes code is running the underlying method as taught by Smilansky in claim 1 and claim 17, (col. 8, lines 26-68; and col. 9, lines 16-25).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 6-8, 10, 22, 23, 24, 26, 36, 38, 39, 40, 42** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagawa et al. US-PAT-NO: 5,055,923, (hereinafter, Kitagawa).

Regarding, **claim 6,** as best understood from the claim language, Kitagawa teaches the method of claim 4, and further teaches that the screen pattern D_c for the cyan printer are obtained by rotating the configuration of the screen pattern data D_m for the magenta printer, shown in figure 8b, and the screen pattern data for the black printer D_k are obtained by rotating the configuration of the screen pattern data D_y for the yellow printer shown in figure 8b, which reads on "the halftone output generated by one of the screens is rotated", (col. 12, lines 3-10). Kitagawa in the present invention does not expressly disclose in the embodiment of the invention, "the halftone output generated by one of the screens is rotated at a zero angle and the halftone outputs generated by two of the screens is rotated in different directions at second and third angles greater than zero, and the halftone output generated with the greater LPI is rotated at a fourth angle, wherein the screens are rotated from the vertical axis".

However, Kitagawa teaches in the background of the invention, that conventional methods prevent color shift by halftone images with respective screen structure with respective angles such as 0-degrees, 15-degrees, forty-five-degrees, and seventy-five-degrees, respectively,

which reads on, "at a zero angle and the halftone outputs generated by two of the screens is rotated in different directions at second and third angles greater than zero, and the halftone output generated with the greater LPI is rotated at a fourth angle, wherein the screens are rotated from the vertical axis", (col. 1, lines 25-30; col. 10, lines 10-15).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Kitagawa's present invention with the conventional methods of halftone output.

One of ordinary skill in the art would have been motivated to have angles of 0 deg, 15 deg, 45 deg, and 75 deg, because when halftone images have a common screen structure, or common arrangement of halftone dots, the printed matter is liable to color shift, given the express suggestion of Kitagawa, (col. 1, lines 21-25).

Regarding, **claim 7,** Kitagawa inherently teaches the fourth angle is approximately equal to zero as evidenced in the teachings that among four halftone images with respective screen structure with respective screen angles, one of the screen angles is designated as zero degrees, (col. 1, lines 25-30).

Regarding, **claim 8,** Kitagawa inherently teaches wherein the fourth angle is approximately less than twenty degrees as evidenced in the teachings that among the four halftone images with respective screen structure with respective screen angles, at least two of the screen angles are less than twenty degrees, such as zero degrees, and fifteen degrees, (col. 1, lines 25-20; col. 10, lines 10-15).

Regarding, **claim 10,** Kitagawa teaches the method of claim 9, and further teaches in equation 7 that the ratio of the first screen pitches is 3:2, but it can be any ratio expressed with

integers, which reads on "the LPI of the halftone output generated by at least one screen is approximately the integer multiple of the LPI of the halftone output generated by at least one other screen", (col. 19, lines 30-44; col. 20, lines 52-54).

Kitagawa does not expressly disclose, "the halftone output with the integer multiple LPI is rotated approximately a 45 degree angle".

However, Kitagawa teaches of conventional halftone methods wherein the halftone images have respective screen structure with respective screen angles such as 45 degrees, which reads on ""the halftone output with the integer multiple LPI is rotated approximately a 45 degree angle", (col. 1, lines 27-30; col. 12, lines 10-15).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Kitagawa's present invention with the conventional methods of halftone output.

One of ordinary skill in the art would have been motivated to have angles of 45 degrees because when halftone images have a common screen structure, or common arrangement of halftone dots, the printed matter is liable to color shift, given the express suggestion of Kitagawa, (col. 1, lines 21-25).

Regarding, **claim 22,** please refer to the corresponding rejection in claim 6.

Regarding, **claim 23,** please refer to the corresponding rejection in claim 7.

Regarding, **claim 24,** please refer to the corresponding rejection in claim 8.

Regarding, **claim 26,** please refer to the corresponding rejection in claim 10.

Regarding, **claim 36,** please refer to the corresponding rejection in claim 4.

Regarding, **claim 38,** please refer to the corresponding rejection in claim 6.

Regarding, **claim 39,** please refer to the corresponding rejection in claim 7.

Regarding, **claim 40,** please refer to the corresponding rejection in claim 8.

Regarding, **claim 42,** please refer to the corresponding rejection in claim 10.

Allowable Subject Matter

8. **Claims 3, 11, 19, 27, 35, 43** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. **Claims 3, 19, and 27** are allowed because the prior art of record does not teach or suggest the collective features of the invention such as the halftone outputs generated by three of the screens have a same LPI and the halftone output generated by one screen has an LPI that is at least approximately 20% different than the LPI of the halftone outputs generated by the other three screens. **Claims 11, 27, and 43** are allowed because the LPI of the halftone output generated by at least one screen is less than approximately 50% more than the LPI of the halftone output generated by at least one other screen, and wherein the halftone output with the 50% greater LPI is rotated at approximately an angle less than approximately 30 degrees.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie M Vida whose telephone number is (703) 306-4220. The examiner can normally be reached on 8:30 am 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott A Rogers can be reached on (703)305-4726. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Melanie M Vida
Examiner
Art Unit 2626

MMV

mmv
June 24, 2004

SCOTT ROGERS
PRIMARY EXAMINER